

What is claimed is:

1. A head restraint assembly adapted to operatively engage the seat back of a vehicle seat and provide four-way adjustment, said head restraint assembly comprising:

a frame adapted to operatively engage the seat back of a vehicle;

a housing adapted to operatively engage a portion of said frame, said housing including at least one aperture disposed along a horizontal axis perpendicular to said frame;

a cam assembly disposed within said housing adapted to provide fore/aft adjustment of said housing relative to said frame, said cam assembly including a camshaft extending along the horizontal axis and at least two drum assemblies operatively supported by said camshaft, said cam assembly further including a contact plate extending parallel to said camshaft and adapted to releasably engage said drum assemblies, said camshaft operatively connected to said contact plate to provide releasable engagement between said contact plate and said drum assemblies; and

a control member adapted to operatively engage said cam assembly and provide for fore/aft and vertical adjustment in response to user input.

2. The head restraint assembly as set forth in claim 1 wherein said cam assembly further includes at least two cam lobes disposed along said camshaft, said cam lobes adapted to operatively engage said contact plate to releasably engage said drum assemblies thereby providing fore/aft adjustment of said housing about said drum assemblies.

3. The head restraint assembly as set forth in claim 2 wherein said cam lobes include an arcuate outer surface having at least two tangs adapted to define the field of mechanical communication between said camshaft and said contact plate.

4. The head restraint assembly as set forth in claim 2 further includes a bridge disposed between said lobes, said bridge adapted to provide structural support to said lobes.

5. The head restraint assembly as set forth in claim 1 wherein each of said drum assemblies include an annular outer surface about which said housing may rotate during fore/aft adjustment of said head restraint assembly.

6. The head restraint assembly as set forth in claim 5 wherein said annular outer surface includes a plurality of aligned detents in spaced relation relative to each other to define a predetermined number of fore/aft adjustment positions, said detents adapted to receive a portion of said contact plate to provide a positive stop for each adjustment position in both the fore and aft direction.

7. The head restraint assembly as set forth in claim 1 wherein said drum assemblies further include a drum, a drum sleeve in mating relation to said drum, a duct extending through said drum assemblies adapted to receive the terminal ends of said camshaft and a conduit extending through said drum assemblies adapted to receive said frame.

8. The head restraint assembly as set forth in claim 7 wherein said drum includes a port aligned with the horizontal axis of said housing and a channel parallel to said frame; said drum sleeve including a bore aligned with the horizontal axis of said housing and a groove

parallel to said frame aligned with said channel, said port and said bore cooperating to define said duct and said channel and said groove cooperating to define said conduit.

9. The head restraint assembly as set forth in claim 1 further including at least two slide carriages, each of said slide carriages including a base operatively connected to said drum assembly, and at least one sidewall extending from said base, said sidewall fixedly supported relative to said camshaft.

10. The head restraint assembly as set forth in claim 9 wherein said frame includes a plurality of notches extending along a vertical axis in spaced relation relative to each other, said base of said slide carriage including at least one orifice adapted to receive said frame and at least one engaging surface defined by said orifice and adapted to releasably engage said notches to provide a positive stop for each adjustment position in the vertical direction.

11. The head restraint assembly as set forth in claim 9 wherein said camshaft further includes at least two standoffs annularly disposed about said camshaft, said sidewall of said slide carriages further including an engaging member adapted to communicate with said camshaft through axial movement between said standoff and a terminal end of said camshaft during vertical adjustment of said head restraint assembly.

12. The head restraint assembly as set forth in claim 9 wherein said drum assemblies further include an elongate passage adapted to receive said base of said slide carriage to maintain a fixed relationship between said base and said frame.

13. The head restraint assembly as set forth in claim 1 wherein said contact plate includes a tension member adapted to provide tension between said contact plate and said drum assemblies to provide a releasably locking positive stop for each adjustment position in both the fore and aft direction.

14. The head restraint assembly as set forth in claim 1 wherein said control member includes a biasing member adapted to provide resilient communication between said control member and said cam assembly in response to user input.

15. The head restraint assembly as set forth in claim 1 wherein said housing further includes a plurality of slots adapted to receive said contact plate to maintain the relationship between said contact plate and said camshaft and said contact plate and said drum assemblies.

16. A vehicle seat having a head restraint assembly adapted to operatively engage the seat back of a vehicle seat and provide four-way adjustment, said vehicle seat comprising:

a lower seat assembly supported on a mounting assembly to operatively secure said lower seat assembly to a vehicle;

a seat back operatively supported by said lower seat assembly;

a head restraint assembly adapted to provide four-way adjustment, said head restraint assembly including a frame adapted to operatively engage the seat back of a vehicle, said head restraint assembly further including a housing adapted to operatively engage a portion of said frame, said housing including at least one aperture disposed along a horizontal axis perpendicular to said frame, said head restraint assembly further including a cam assembly disposed within said

housing adapted to provide fore/aft adjustment of said housing relative to said frame, said cam assembly including a camshaft extending along the horizontal axis and at least two drum assemblies operatively supported by said camshaft, said cam assembly further including a contact plate extending parallel to said camshaft and adapted to releasably engage said drum assemblies, said camshaft operatively connected to said contact plate to provide releasable engagement between said contact plate and said drum assemblies, said head restraint assembly further including a control member adapted to operatively engage said cam assembly and provide for fore/aft and vertical adjustment in response to user input.

17. The head restraint assembly as set forth in claim 16 wherein said cam assembly further includes at least two cam lobes disposed along said camshaft, said cam lobes adapted to operatively engage said contact plate to releasably engage said drum assemblies thereby providing fore/aft adjustment of said housing about said drum assemblies.

18. The head restraint assembly as set forth in claim 16 wherein each of said drum assemblies include an annular outer surface about which said housing may rotate during fore/aft adjustment of said head restraint assembly, said annular outer surface including a plurality of aligned detents in spaced relation relative to each other to define a predetermined number of fore/aft adjustment positions, said detents adapted to receive a portion of said contact plate tensionally supported by said housing to provide a positive stop for each adjustment position in both the fore and aft direction.

19. The head restraint assembly as set forth in claim 16 wherein said drum assemblies further include a duct extending through said drum assemblies along the horizontal axis of said housing adapted to receive the terminal ends of said camshaft and a conduit extending through said drum assemblies adapted to receive said frame.

20. The head restraint assembly as set forth in claim 16 further including at least two slide carriages, each of said slide carriages including a base operatively connected to said drum assembly, said base including at least one orifice adapted to receive said frame, said slide carriages further including at least one sidewall extending from said base, said sidewall adapted to communicate with said camshaft through axial movement during vertical adjustment of said head restraint assembly.